



# RESCCUE RAF APP – AN IT SOLUTION FOR DIGITAL INTERACTIVE URBAN RESILIENCE ASSESSMENT

Pedro Lopes, Anabela Oliveira, Cristina Pereira, Rita S. Brito, Maria A. Cardoso,  
Ricardo Martins, Mário David, Jorge Gomes, João Pina

# What is RAF App

A tool to support the use of RAF (Resilience Assessment Framework) developed within 

and as Service of  Infraestruturas  
Nacionais de  
Computação  
Distribuída

- **Scope**: assess **urban resilience to climate change**, with focus on **water** e.g., drought, flood...
- **Emphasis** on **city, services and infrastructure resilience** e.g., social and political dimensions are not the focus for diagnosis, but are taken into account whenever important for city, services and infrastructure resilience
- **Objective driven** framework, as resilience diagnosis is based on the **level of compliance** of the resilience objectives

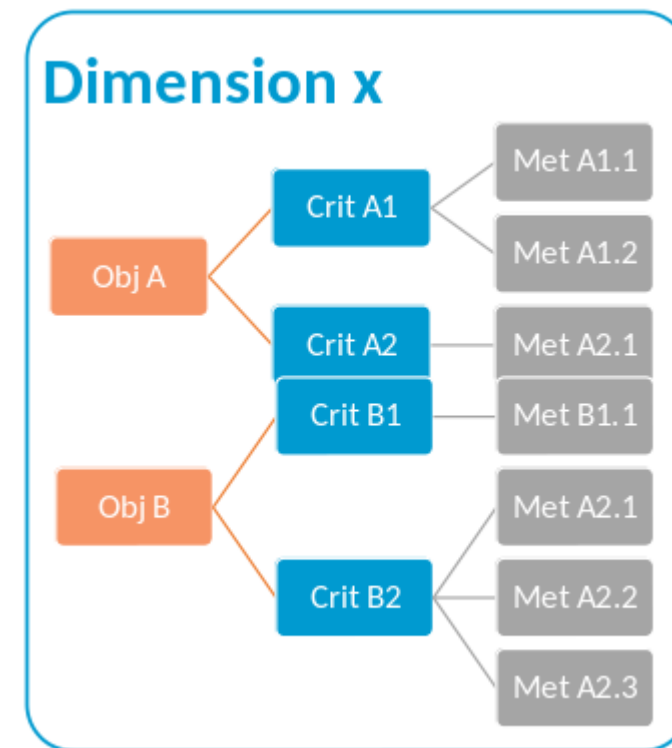
# RAF Structure

## ■ Resilience dimensions

- **Organisational** resilience: considering governance relationships
- **Spatial** resilience: covering urban space and environment
- **Functional** resilience: focused on strategic services in the city (**water, wastewater, stormwater, waste, energy** and **mobility**)
- **Physical** resilience: centered on infrastructure of these services

## ■ Resilience Objectives

- **Objectives assessed by criteria**, expressing different points of view
- **Criteria quantified by metrics**, evaluated by reference values (providing a user-friendly assessment to support a structured diagnosis)



# The Challenge

- Create an **user-friendly** application that relays on a complex structure as RAF;
- Create an accessible tool that provides **instant results** to users from anywhere;
- Develop a **robust application** so other Assessment Frameworks different from RAF can be easily created within the App.

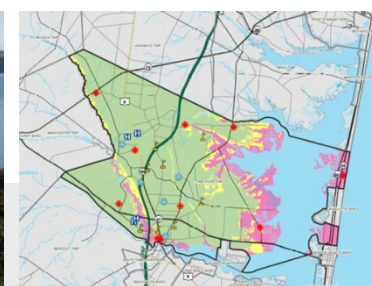
# RAF App

## Potential users

- municipalities
- utilities of urban strategic services
- consultants and researchers

## Areas of interest

- climate change
- urban resilience
- civil, urban water and environmental engineering
- any other multidisciplinary assessment



# RAF App

- Web App with user authentication;
- Make use of VCPUs and storage from INCD infrastructure;
- 3 beta cities: Barcelona, Lisbon and Bristol.

The screenshot shows the login interface of the RAF App. On the left side, the logo for 'RAF APP' is displayed, with the text 'CLIMATE CHANGE RESILIENCE ASSESSMENT FRAMEWORK TOOL FOR URBAN AREAS' underneath. On the right side, there is a 'Login' section containing two input fields for 'Username' and 'Password', and a 'Login' button. At the bottom of the page, there are several logos and text: the RESCCUE logo, the European Union flag, and a text block stating 'This project has received funding from European Commission by means of Horizon 2020. The EU Framework Programme for Research and Innovation, under Grant Agreement no. 700174'. Additionally, there are small logos for 'Funding', 'Development', and 'Thanks to Credits' at the bottom center.

# Study Manager



- Each user can manage his studies and/or create new ones;
- Possibility to access a quick view with overall results in each city study.

# City Location

Studies Manual Beta Version

English admin (Administrator) RAF APP  
CLIMATE CHANGES RESILIENCE ASSESSMENT FRAMEWORK  
TOOL FOR URBAN AREAS

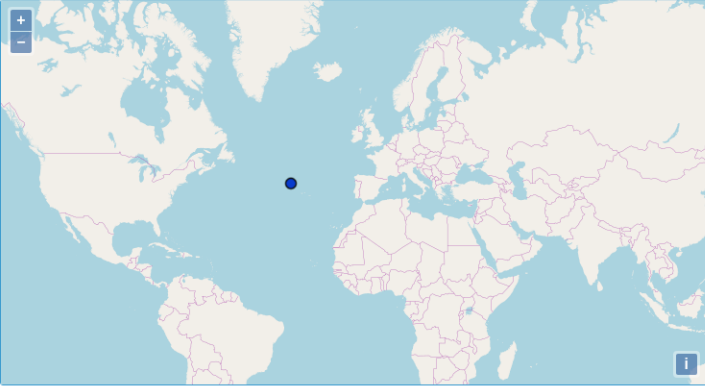
City location Organisational Spatial Functional Physical Results

Back SAVE

Lisbon soh para Debug City Plan

General City Profile Services Profile

City location



City name  
Lisbon soh para Debug

Year  
2018

Latitude  
40.07742

Longitude  
-32.34814

Choose dimensions and respective services:

<input checked="" type="checkbox"/> Organisational	<input checked="" type="checkbox"/> Spatial	<input checked="" type="checkbox"/> Functional	<input checked="" type="checkbox"/> Physical
		<input type="checkbox"/> Water	<input type="checkbox"/> Water
		<input checked="" type="checkbox"/> Wastewater	<input checked="" type="checkbox"/> Wastewater
		<input checked="" type="checkbox"/> Stormwater	<input checked="" type="checkbox"/> Stormwater
		<input checked="" type="checkbox"/> Waste	<input checked="" type="checkbox"/> Waste
		<input checked="" type="checkbox"/> Energy	<input checked="" type="checkbox"/> Energy
		<input checked="" type="checkbox"/> Mobility	<input checked="" type="checkbox"/> Mobility

Back to Top

Funding Development Thanks to Credits  
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- Inside city study user can choose what areas/services of the city want to assess.



# Dimension

Studies Manual Beta Version

English admin (Administrator) RAF APP  
CLIMATE CHANGE RISK SERVICE ASSESSMENT FRAMEWORK  
TOOL FOR URBAN AREAS

City location Organisational Spatial **Functional** Physical Results

Back SAVE

Lisbon soh para Debug City Plan



Water Wastewater Stormwater Waste Energy Mobility

Objective Wastewater Service Planning And Risk Management

Objective and Criteria Flexible service

Importance Comprehensive

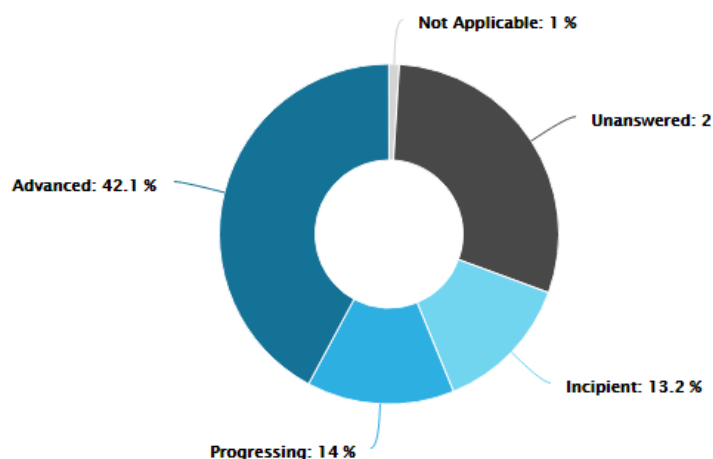
Ref	PI / Question	+info	City Answer	Specify why
434	<b>PI: Treated wastewater uses</b>  <b>Question:</b> Percentage of treated wastewater being recycled or reused (for e.g. irrigation, urban cleaning, firefighting)	<input type="button" value="i"/> CH	<input type="text" value="Not applicable in the city, explain why in comments."/>	<input type="text" value=""/>
435	<b>PI: Wastewater disposal</b>	<input type="button" value="i"/> <input type="checkbox"/> a) superficial streams <input type="checkbox"/> b) culverted streams <input checked="" type="checkbox"/> c) tidal coast <input type="checkbox"/> d) bathing waters <input type="checkbox"/> e) submarine outfall <input type="checkbox"/> f) other (specify in Comments) <input type="checkbox"/> g) none		<input type="text" value=""/>



 Thanks to apply Credits the city, explain why in comments.  
 © 2018

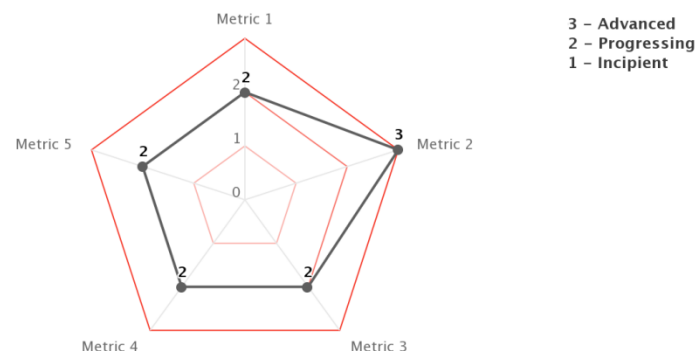
- Inside each dimension user can navigate by criteria and objective;
- Fill the applicable metrics.

# Assessment Results

Metrics within each development level for City

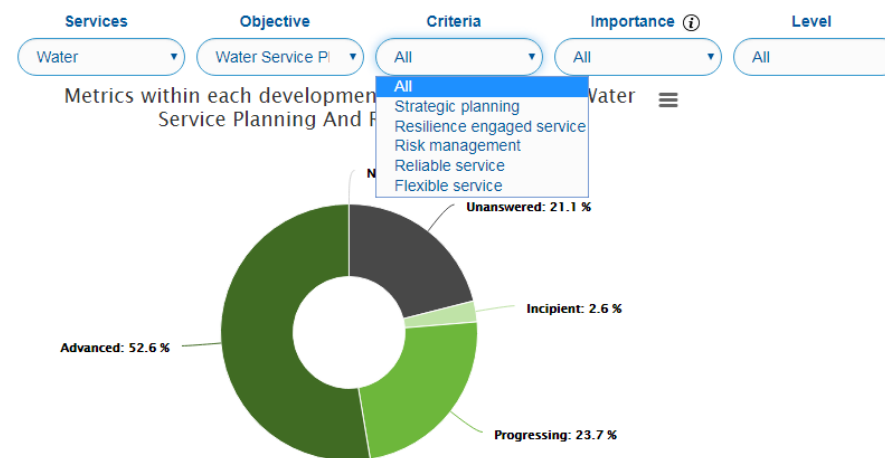
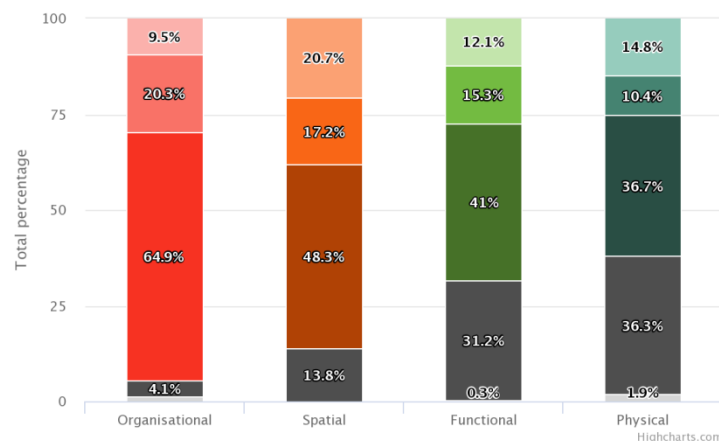


Development level for Criteria: Citizens and communities engagement



- Calculated on-demand;
- Presented in multiple chart types that can be locally saved by user;
- Possibility of drilldown results for deep assessment;

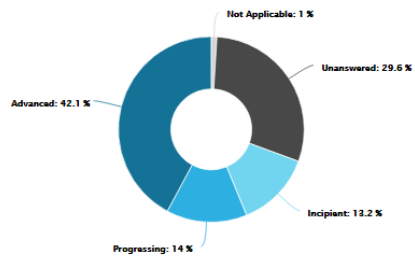
Development level for each Dimension



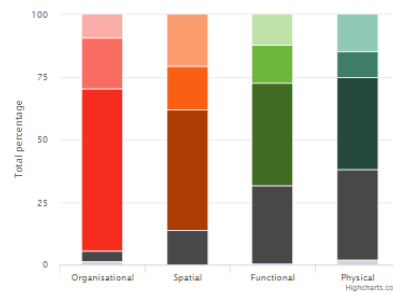
# City Report

## Overall

Metrics within each development level for City



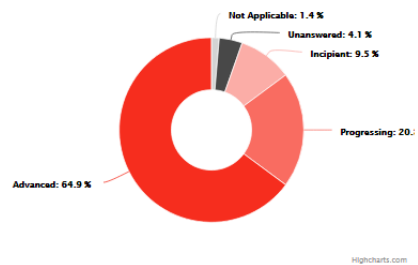
Development level for each Dimension



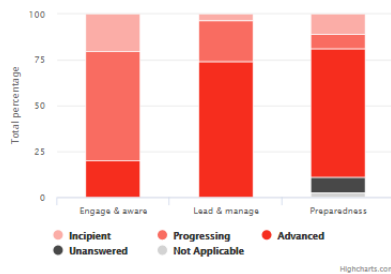
- Summarise city assessment as a whole;
- Quick view of overall and dimension results.

## Organisational

Metrics within each development level for Dimension: Organisational

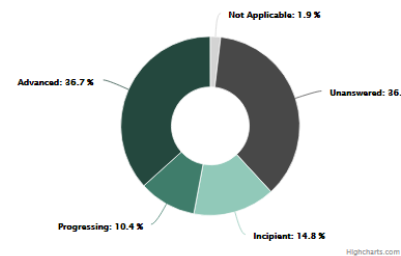


Development level for each Objective for Dimension: Organisational

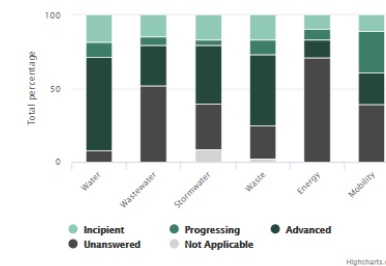


## Physical

Metrics within each development level for Dimension: Physical



Development level for each Service for Dimension: Physical



# Future Work

- Expand RAF App to more cities;
- Use different assessment frameworks in the application;

# Aknowledgements

- Funding:

European Commission by means of Horizon 2020, the EU Framework Programme for Research and Innovation, under Grant Agreement no. 700174.



Thank you for your attention